Effectiveness of Allergic Rhinitis Management Related to WHO Guideline on Allergic Rhinitis and Its Impact on Asthma (ARIA)

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Abstract

Background: The standard procedure of Allergic Rhinitis (AR) Management in Indonesia is based on Allergic Rhinitis and Its Impact on Asthma (ARIA) World Health Organization (WHO) 2008 guideline; however, it needs some adjustment to get an effective use locally in Indonesia. The data related to the problem however did not exist in Indonesia. The study aimed to evaluate the effectiveness of AR patient management based on the ARIA WHO guideline in the Department of Otorhinolaryngology-Head and Neck Surgery Dr. Hasan Sadikin General Hospital Bandung.

Methods: The study was conducted from September to October 2015 using quantitative descriptive design to observe the development of ARIA classification, total nasal symptom score (TNSS), and quality of life (QoL) during the first 6 months of therapy. The data were obtained from medical records of AR patients who visited the Rhinology-Allergy clinic Department of Otorhinolaryngology-Head and Neck Surgery Dr. Hasan Sadikin General Hospital within one year. Thirty three patients were included in the study using total sampling.

Results: There was significant improvement ($p<0.001$) in ARIA classification, TNSS, and QoL between the initiation of therapy, the third, and the sixth month. In contrary, there was no significant difference in ARIA classification ($p=0.109$), TNSS ($p=0.317$), and QoL ($p=1.000$) between the third and the sixth month of therapy.

Conclusions: Allergic rhinitis patient management based on the 2008 ARIA WHO guideline is effective. **[AMJ.2016;3(4):538–44]**

Keywords: Allergic rhinitis, asthma, effectiveness, management

Introduction

Allergic Rhinitis (AR) is an inflammation of the nasal mucosa mediated by Immunoglobulin E (IgE) after exposure to allergen. The inflammatory reaction manifests as runny nose, nasal congestion, sneezing, and nasal itching. The clinical manifestation recurs after each exposure to the initiating allergen.[1] Although there are not yet data on the national prevalence of AR in Indonesia, previous study conducted in 2010 at the Department of Otorhinolaryngology-Head and Neck Surgery Dr. Hasan Sadikin General Hospital Bandung showed the prevalence of AR is 24.5%.[2] Clinical manifestations of AR often cause impairment of quality of life (QoL). The impairment of QoL is caused by sleep disturbance and problems with social activities, school and work performance.[1,3] This may lead to a decrease in productivity, and therefore impacts on the economy.[3]

According to the 2008 Allergic Rhinitis and its Impact on Asthma (ARIA) World Health Organization (WHO) guideline allergic rhinitis is classified based on disease severity and symptom duration. The classifications consist of mild intermittent AR (MI-AR), mild persistent AR (MP-AR), moderate/severe intermittent AR (MSI-AR), and moderate/severe persistent AR (MSP-AR). These classifications determine the therapeutic plan of AR that includes allergen avoidance, patient education, pharmacotherapy and

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specific immunotherapy (SIT). According to the 2008 ARIA WHO recommendations, all four categories should undertake allergen avoidance and receive patient education and pharmacotherapy. Pharmacotherapy also differs from each classification and includes intranasal corticosteroid, H1 antihistamine, and leukotriene receptor antagonist (LTRA) among others. For persistent AR, it is recommended that intranasal corticosteroid should be given as a first-line therapy. Specific immunotherapy is only recommended for MP-AR, MSI-AR, and MSP-AR.[1] Hence, only the three categories are recommended for the complete combined therapy. Even so, the management for AR patients may be adjusted accordingly if patients experience improvement or worsening in ARIA classification.

The management for ARIA in Indonesia has been performed according to the recommendations of the 2008 ARIA WHO. However, the 2008 ARIA WHO guideline is meant to be a guide to formulate an AR management guideline that is suitable to local environment and circumstances.[1,4] Up until now, there has been no data on the effectiveness of AR management based on the 2008 ARIA WHO guideline in Dr. Hasan Sadikin General Hospital or in any hospital in Indonesia. Therefore, an evaluation of the effectiveness of the 2008 ARIA WHO guideline in a local setting is needed. The evaluation of the 2008 ARIA WHO guideline recommendations effectiveness will be done based on guideline therapy goals that include improvements in ARIA classification, Total Nasal Symptom Score (TNSS), and patient QoL. Hence, the aim of this study is to evaluate the effectiveness of AR patient management according to the 2008 ARIA WHO guideline in the Rhinology-Allergy clinic of the Department of Otorhinolaryngology-Head and Neck Surgery Dr. Hasan Sadikin General Hospital.

Methods

This study was conducted in the Rhinology-Allergy clinic of the Department of Otorhinolaryngology-Head and Neck Surgery Dr. Hasan Sadikin General Hospital and used a quantitative descriptive research design. The study was conducted from September to October 2015. The study samples were AR patients managed in the Rhinology-Allergy clinic that fulfilled the following inclusion criteria: patients classified as MP-AR, MSI-AR, and MSP-AR; patients having started SIT between March 1st 2014 and March 31st 2015; and patients having undertaken SIT for a minimum of 6 months. The samples which were not included were: patients starting SIT outside of the given time period, patients having undertaken SIT less than 6 months' time, and patients classified as MI-AR.

Study samples were taken according to total sampling method and this study included 33 AR patients who visited the Rhinology-Allergy clinic. The Subject data were taken from medical records, and permission regarding information disclosure was obtained through the Ethical Committee of Dr. Hasan Sadikin General Hospital and Faculty of Medicine Universitas Padjadjaran. The data were analyzed statistically to discover the variable frequency.

Research variables that were evaluated included the AR classification according to the 2008 ARIA WHO guideline, TNSS, and the QoL disturbance. Allergic rhinitis classifications consist of MSP-AR, MSI-AR, MP-AR, and MI-AR. Total nasal symptom score was divided into very mild (a score of 0-2), mild (3-6), moderate (7-9), and severe (10-12) according to score presented in the medical record. Disturbance in QoL was recorded as those impaired and those not impaired. These variables were taken from the records of the patient's first visit (designated month 0), the third month of therapy (month 3) and the sixth month of therapy (month 6). The data were then analyzed to evaluate the frequency of each variable during each time frame to see differences between each time frame and also the significance of changes using Wilcoxon Signed-Rank test and McNemar's test. The result would be deemed significant if p value was <0.05 and insignificant if p value was >0.05.

The research variables were also included general characteristics such as age, gender and occupation, which would be presented as frequency. Comorbidities were also taken into account and were shown as frequency of those with comorbidities and those without along with the frequency of the types of comorbidities present.

Results

From 40 children, numbers of boy and girl in The subjects' general characteristics were mostly women (69.7%) with the highest range of age in the 18–34 age group (42.4%), followed by 35–49 age group (33.3%) (Table 1). A majority of the subjects were school/college students (30.3%) and housewives

Table 1 Subjects' General Characteristics

Variable	AR Patient	
	n	%
Gender		
Female	23	69.7
Male	10	30.3
Age, range		
≤17	5	15.2
18–34	14	42.4
35–49	11	33.3
50–64	3	9.1
≥65	0	0
Occupation		
Civil Servant	8	24.2
Private Employee	5	15.2
Student/College Student	11	33.3
Housewife	9	27.3
Unemployed	0	0
Others	0	0
Comorbidity		
Present	20	60.6
Absent	13	39.4

Note; AR: Allergic rhinitis; n: Number of AR patient; %: Percentage of AR patient

(27.3%).

Comorbidities were also present in 60.6% of the subjects with the other 13 people without comorbidities. Rhinosinusitis was the most prevalent comorbidity in the study with a frequency of 50% (Table 2). The least prevalent comorbidity was conjunctivitis, otitis media, and atopic dermatitis with 5% each.

At the beginning of the study the most common AR classification was based on the 2008 ARIA WHO guideline among the subjects was MSP-AR with 42.4% with no subjects classified as MI-AR (Table 3). All of the subjects had impaired QoL and most had moderate symptoms (60.6%). By the 3rd

Table 2 Comorbidity Distribution

Comorbidity	AR Patient (n=20)	
	N	%
Rhinosinusitis	10	50
Nasal polyp	5	25
Asthma	2	10
Conjunctivitis	1	5
Atopic dermatitis	1	5
Otitis media	1	5

Note: AR: Allergic rhinitis; n:Number of AR patient; %: Percentage of AR patient

Table 3 ARIA Classification, TNSS and QoL Impairment Changes at Month 0, 3, and 6

Variable	AR Patient						P value (a)*	P value (b)**	P value (c)#
	Month 0		Month 3		Month 6				
	n	%	n	%	n	%			
ARIA Classification									
MSP-AR	22	66.7	2	6.1	0	0	<0.001	0.109	<0.001
MSI-AR	6	18.2	0	0	0	0			
MP-AR	5	15.2	1	3	1	3			
MI-AR	0	0	30	90.9	32	97			
TNSS									
Severe	9	27.3	0	0	0	0	<0.001	0.317	<0.001
Moderate	20	60.6	0	0	0	0			
Mild	4	12.1	1	3	3	9.1			
Very mild	0	0	32	97	30	90.9			
QoL Impairment									
Impaired	33	100	3	9.1	3	9.1	<0.001	1.000	<0.001
Not Impaired	0	0	30	90.9	30	90.9			

Note: AR: Allergic rhinitis; ARIA: Allergic Rhinitis and its Impact on Asthma; MSP: Moderate severe persistent; MSI: Moderate severe intermittent; MP: Mild persistent; MI: Mild intermittent; n:Number of AR patient; %: Percentage of AR patient, *P value (a) is the differences in variables between Month 0 and 3, **P value (b) is the differences in variables between Month 3 and 6, #P value (c) is the differences in variables between Month 0 and 6

month of therapy, the frequency of patients classified as MSP-AR was reduced to 6.1% with the highest frequency belonging to the MI-AR classification (90.9%). The number of patients showing severe and moderate symptoms was decreased to zero and those with impaired QoL decreased to 9.1%. More than a half of the subjects had no symptoms (69.7%) and no QoL impairment (90.9%). After 6 months of therapy, no subjects were classified as moderate/severe and only 3% were MP-AR while the rest was MI-AR (97%). Patients who did not present with QoL impairment were 90.9%.

The result of statistical analysis using the Wilcoxon Signed-Rank test demonstrated

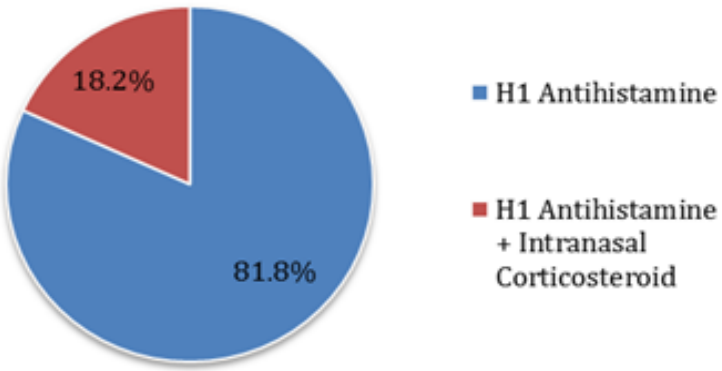

Figure Profile of Drug Use

that the ARIA classification and TNSS changes between start of therapy and the third month is significant with p value <0.001 (Table 3). This was also true of statistical analysis of the changes in QoL between the start of therapy with the third month of therapy using McNemar's test with p value <0.001. The difference between the start of therapy and the sixth month showed similar results to p value <0.001 for each variable. Even so, it was found that the difference in ARIA classification, TNSS, and QoL between the third month and sixth month is not significant.

The distribution of drug combinations used in pharmacotherapy of subjects at the start of therapy showed that the highest frequency of drug used is H1 antihistamine (Figure). The other 18.2% was the combination of H1 antihistamine and intranasal corticosteroid.

Discussions

This study reveals that the distribution of gender, age, occupation, and presence of comorbidity of the study subjects is similar to the previous study in 2014 of AR patients visiting Department of Otorhinolaryngology-Head and Neck Surgery Dr. Hasan Sadikin General Hospital.[5] Study subjects consist mostly of women (69.7%). This high prevalence in women is thought to be due to hormonal differences between genders, in which oestrogen is known to be pro-inflammatory and thus predispose to atopy.[6] The occupation distribution is also similar, with the highest being school/college students (30.3%) and the second highest being housewives (27.3%). It is known that AR affects school age children and thus causes learning disturbance.[1] The study subjects are mostly between 18–34 years of age (42.4%) and the trend declines with increase in age. The previous study showed a decrease in atopy with aging, it is suggested that a decrease in allergen-specific IgE concentration is the cause of this phenomenon.[7]

Most of the study subjects present with comorbidity (60.6%) with rhinosinusitis as the highest frequency (55.6%). This is in line with the previous study that rhinosinusitis is the most prevalent comorbidity in AR patients.2The presence of comorbidity may affect treatment outcome as the most of the comorbidity have the same pathophysiology as AR. The presence of comorbidity in study subjects may affect changes in ARIA classification, TNSS, or QoL disturbances in this study.

There is a significant change in distribution of ARIA classification between the first month of therapy and third month, and also with the sixth month of therapy. The frequency of MSP-AR and MSI-AR decreases between the start of therapy and the sixth month in which the frequency of MSP-AR is as high as 66.7% and MSI-AR as high as 18.2% at the start and only 6.1% and none respectively in the sixth month (Table 3). These findings indicate that patients given therapy according to ARIA WHO 2008 guideline experience an improvement in ARIA classification. These improvements are significant with p value <0.001. A previous study in Spain[8] support these findings that AR patients with moderate-severe classification experience a significant decrease in disease severity to mild after undergoing 4 weeks of pharmacotherapy with second generation H1 antihistamine.

The TNSS and QoL also show significant improvement (p<0.001) before and after 6 months of therapy. At the start of therapy a majority of the patients experience severe symptoms while at the sixth month most of patients' symptoms improve to very mild (Table 3). Quality of life impairment distribution also shows significant change (p<0.001) and by the sixth month of therapy 90.9% of patients experience no impairment. These findings are in line with a previous study in which ARIA recommended pharmacotherapy significantly improve patients' TNSS, QoL score, and disease severity after 4 weeks' time. A different study also shows that SIT is effective in reducing symptoms and medication usage in AR patients.[10]

The distribution change between the start of therapy and the third month with the change between the third and sixth month shows disparity. The distribution change of ARIA classification, TNSS, and QoL between the start and third month of therapy is larger than the change between the third and sixth month. These differences are only significant between the start of therapy and third month but not between the third and sixth month. This occurrence may be explained by the discoveries in a previous study that the largest improvement of QoL score occur in the first week of therapy and the largest improvement of TNSS occur after two weeks of therapy using second generation H1 antihistamine.[11] A different study shows that as much as 52.6% of AR patients with moderate-severe symptoms experience improvement after 4 weeks of pharmacotherapy (p<0.0001).[9]

On another note, the TNSS of 2 subjects

(6.1%) showed worsening between the third and sixth month of therapy, changing from very mild to mild. Also, there is a persistence of QoL impairment in 3 subjects (9.1%) in the same time frame. This TNSS worsening and persistence of impairment may be due to the presence of comorbidity, which is prevalent in this study. Comorbidity is known to affect therapy outcome, TNSS and QoL of AR patients.[12] Therefore, the worsening of subjects' TNSS and persistence of QoL impairment is thought to be due to the presence of comorbidity, which affects the TNSS and QoL of subjects.

A majority of the study subjects receive cetirizine, a second generation H1 antihistamine, as opposed to intranasal corticosteroid such as fluticasone propionate which is the first-line medication for MSP-AR patients according to ARIA WHO 2008 guideline.[1] It is known that intranasal corticosteroid is more effective in reducing AR symptoms than H1 antihistamine[14], and yet patients are instead primarily given H1 antihistamine and is only given intranasal corticosteroid in combination with H1 antihistamine. This discrepancy is due to the availability of medication in the clinic and hospital policy where currently only H1 antihistamine is readily available rather than intranasal corticosteroid.

During the course of this study there were several difficulties in obtaining data from the medical record. Some of this is caused by poor documentation due to unintelligible handwriting. Unsystematic medical record and storage also hindered data collection.

This is the first study to evaluate the effectiveness of AR management based on 2008 ARIA WHO guideline in Dr. Hasan Sadikin General Hospital. There are many studies about the effectiveness and efficacy of pharmacotherapy or SIT alone but none about the effectiveness of ARIA WHO 2008 guideline or the combined effectiveness of pharmacotherapy and SIT.

In summary, despite the discrepancy between practice and ARIA recommendations, AR patient management based on the 2008 ARIA WHO guideline proves to be effective. Even if local circumstance, which in this case limits the drug availability, hinder the application of ARIA recommendation, the guideline is suitable for the local setting in Dr. Hasan Sadikin General Hospital. Thus, the 2008 ARIA WHO guideline is appropriate for use in other healthcare facilities that resembles the setting of this study and as such may be used as guideline for management of local AR patients.

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